

Chief, Economic Research Area

6 August 1956

THRU : Chief, Planning and Review Staff, ORR  
Deputy Chief, Industrial Division, ORR

Project 31.487.

1. The subject project has been reviewed and its publication as a research aid is recommended.
2. This recommendation is made with some hesitancy because of the limitations of the data (almost exclusively U.S. data) and the nature of the war that would require the ammunition mix postulated in the paper (basically, a non-nuclear war of the World War II type).
3. These limitations have at least been pointed out, if not fully discussed, in the paper. In my opinion, they do not significantly invalidate the inputs per ton computation. The first limitation (U.S. data) does not constitute a significant limitation with respect to the material inputs of cast iron, lead, propellants, and explosives; however, the critical problem of the substitution of steel for brass under current technology and Soviet supply conditions makes the estimates for steel, copper and zinc inputs more applicable to the U.S. World War II conditions than the current or future Soviet situation. The use of US data affects the reliability of the estimates of manpower and electric power to a greater extent than some of the material inputs because these data are more directly influenced by differences in industrial organization and practices.
4. The limitations as to the nature of the war is really not as serious as it might at first appear. It is obvious that nuclear explosives will be substituted for certain conventional explosives in the stockpile program for a future war. It is also obvious that the addition of nuclear explosives will reduce the total conventional ammunition requirement, but this overall reduction in itself will not affect the material inputs per ton of conventional ammunition to a serious degree. For some time to come, the substitution of nuclear explosives will be primarily in the fields of aerial bombs and heavy artillery ammunition. There will still be a sizeable requirement for medium and light artillery, small arms, rocket and mortar

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ammunition for "smaller" wars. An examination of the relative weight of the latter groups in the input calculations shows that they constitute more than 85 percent of the ammunition mix used in this paper. On this basis, even the complete elimination of the bomb and heavy artillery categories would not seriously alter the input per ton figures derived.

5. The one important reason for publishing this paper is that it is, with all of its limitations, better than anything else available for use in discussions of problems of export control, material balance and material use patterns. Currently, the intelligence community is using far poorer, and more fragmentary data for these purposes. The data ~~is~~ so presented and documented in this study that many of its limitations (steel-brass and nuclear warfare) can be compensated for according to the actual requirements of the problem under consideration. Therefore, publication of this study is recommended as a research aid.

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